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## BRIEFS

NUCLEAR ACCELERATOR LABORATORY--Wellington (PA)--The D.S.I.R.'s new nuclear accelerator could have significant value for oil and mineral exploration and for medical research, the Minister of Science and Technology, Dr Shearer, has said. Opening the Tandem nuclear accelerator laboratory at the Institute of Nuclear Sciences, Wellington, Dr Shearer said that the accelerator's ability to measure the hydrogen and nitrogen that damage steel structures would help combat problems of corrosion. Rust was costing the country about \$50 million a year, he said. In the field of agriculture, the accelerator could help increase pasture production by 30 per cent. If more was known about how nitrogen moved in pasture it would be possible to retain it and therefore increase plant production. The cost of building the new laboratory was \$300,000. The accelerator, bought from Australia, is worth \$330,000. It works by accelerating the injected atom along a tunnel-like apparatus. [Text] [Christchurch THE PRESS in English 6 Nov 82 p 7]

CSO: 5100/9007

CNEA HEAD REVIEWS PROGRESS, BUDGET REDUCTION

PY122204 Buenos Aires BUENOS AIRES HERALD in English 11 Dec 82 p 9

[Article by Cristina Bonasegna]

[Text] National Atomic Energy Commission (CNEA) President Carlos Castro Madero said yesterday that a reduction in the CNEA budget had forced the commission to slow down the pace of its nuclear programme and that demand for energy had declined due to industrial recession.

Castro Madero held a press conference at the Atucha I Nuclear Plant, 120 km north of Buenos Aires, to reveal detailed information on the CNEA activities in 1982.

The press conference was followed by the installation of the lower section of the containment sphere of the Atucha II Nuclear Plant, which is only metres away from Atucha I, on the Parana de Las Palmas River, in the Zarate District. Atucha II, which is being built by Argentine firms following foreign technology, was to have been finished by July 1987, but is now one and a half years behind schedule.

Castro Madero, who ratified Argentina's intention to limit nuclear energy to peaceful ends, said the country "has no relations with the United States as far as nuclear matters are concerned" due to its refusal to sign the Tlatelolco nuclear proliferation treaty.

The CNEA president said Canada will review its nuclear policy towards Argentina once it had finished building the Embalse plant, in Embalse Del Rio III, Cordoba. The plant was scheduled to be operating by January 1980 but will now be ready by March 1983.

Switzerland, which is providing the technology to build a heavy water plant in Arroyito, and West Germany, which is giving Argentina the know-how to build the Atucha II plant, will not interrupt their programmes.

Castro Madero said there have been important developments in the country's nuclear programme this year "in spite of the economic difficulties," and stated that the CNEA share of the national budget is expected to shrink next year, although he added the issue is still being discussed at the economy ministry.

Castro Madero, an atomic physicist at the head of the CNEA since 1976, said the political parties' interest in atomic energy will ensure the continuity of the programme once the country has returned to democracy.

Among the CNEA achievements for 1982, he listed the production of 190 tons of uranium concentrate at the Malargue and San Rafael plants, the inauguration of the RA6 reactor for research purposes in the Bariloche Atomic Centre and the inauguration of the Los Gigantes Mining-factory Complex, which will turn out 100 tons of U308 a year.

In the international arena, Castro Madero said construction of an atomic centre in Peru continued and that the CNEA and Colombia have signed an agreement for direct negotiations for the provision of nuclear equipment.

Castro Madero told the HERALD that the company in charge of building the Atucha II plant, set up in 1980, is 75 percent CNEA owned, while 25 percent of it belongs to the KWV German firm.

Eventually, he said, the company will become a wholly Argentine concern, since either the CNEA itself or private firms will acquire the shares now owned by the West German firm.

CSO: 5100/2016

# REPORTAGE ON TRANSFER OF IPEN TO FEDERAL JURISDICTION

## Confirmation by IPEN Superintendent

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 19 Nov 82 p 16

[Text] The superintendent of the Institute of Energy and Nuclear Research (IPEN), Hernani Amorim, confirmed yesterday that on the basis of an agreement signed between the government of the state of Sao Paulo and the National Nuclear Energy Commission (CNEN), the IPEN is being transferred to the responsibility of the federal area, becoming subordinated to the CNEN.

According to him, the measure is the result of studies that have been conducted for several months after the decision taken by the federal government to centralize all of the country's nuclear research institutes within the CNEN. Amorim denied that the federalization of the IPEN is related to the election of Franco Montoro to the governorship of the state. "He was elected? I did not even know that," he said.

The secretary of Industry, Commerce, Science and Technology, Osvaldo Palma, denied the federalization of the IPEN, "at least the way it was reported by the newspapers," explaining that what happened "was a simple agreement with the National Nuclear Energy Commission, which is now going to assume all financial charges for the institute."

According to Palma, with that agreement the state is going to save 3.5 billion cruzeiros, funds that had already been provided in the public budget for next year and which can be reallocated.

In an official released in Rio yesterday, the National Nuclear Energy Commission explains that it has been coordinating research and personnel training activities for some time. To promote that research and bring a more immediate return, the CNEN planned the installation of a research center in Campo de Roma, located in the municipality of Itaguaí, where there will be good conditions for nuclear technology training as a result of the applied research that will be conducted there.

With the containment of expenses and the need to delay the installation of the first groups of activities in Campo de Roma, avoiding the construction of a costly, even modular infrastructure in the coming fiscal years, the CNEN speeded up alternative measures that would make it possible in the short term to meet the goals and commitments incumbent on it in the nuclear area.



The CNEN revealed that, about 2 years ago, the government of the state of Sao Paulo had been negotiating for the commission to assume the charges of the IPEN, which was going through financial difficulties and was not in a situation to maintain the operational and professional market levels of other similar organizations. On 1 November, the CNEN concluded an agreement with the state government reintegrating the IPEN into its staffs. According to the CNEN, the measure thus adopted makes feasible the long-sought solution to the difficulties of an institutional and financial nature that prevented the recruitment and retention of highly specialized personnel for expansion of the activities of the IPEN.

According to the note, with the CNEN taking care of the IPEN's financial charges stemming from its activities, the state of Sao Paulo will be free to invest in other energy sectors.

The agreement was signed by the chairman of the National Nuclear Energy Commission, Rex Nazare Alves, and by the secretary of industry, commerce, science and technology of the state of Sao Paulo.

#### Topazes

The merchant Virgilio Tamberlini Neto, who charged that 20 kg of topazes had received high levels of radioactivity in irregular irradiation conducted in the IPEN reactor, yesterday termed "cynical" the result of the inquiry conducted by the IPEN to investigate the case, which concluded that there had not been irregular or clandestine irradiation at the institute.

Virgilio believes that this result is refuted by the attitude of the CNEN itself, which in January suspended the irradiation conducted at the IPEN to change the coloration of precious stones and thus far has not given authorization for release of the last batches of topazes irradiated at the end of last year. The merchant was invited to testify in the inquiry but refused to do so alleging that that investigation was "a farce" set up to cover up those responsible.

#### Confirmation by Mines and Energy Ministry

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 18 Nov 82 p 24

[Text] Ministry of Mines and Energy experts confirmed in Brasilia yesterday, the report emanating from Sao Paulo and not yet announced officially that the Institute of Energy and Nuclear Research, connected with the Sao Paulo state government will be transferred to the federal area. However, the same informants asserted that the transfer of the IPEN to the federal government had been planned for a long time with the aim of concentrating the institute's research within the scope of the National Nuclear Energy Commission (CNEN) and is not connected with the already assured election of Franco Montoro of the Brazilian Democratic Movement Party (PMDB) as governor of Sao Paulo.

The ministry experts maintained that the measure adopted by the current governor, Jose Maria Marin, is not aimed at deflating Franco Montoro's administration but is only intended to concentrate the activity and the results of nuclear research within the federal area. According to them, IPEN will benefit from its transfer to the federal government inasmuch as it will be able to get more funds for its research.

According to the experts, the CNEN is already preparing a proposal to the federal government to obtain more funds for the IPEN to use in 1983 in accordance with the interests of that nuclear energy commission. The experts did not reveal when the transfer of the IPEN to the federal government was decided upon, nor the changes that may be made in the institute. They assert, however, that the change will be for the better, both for the IPEN as well as for nuclear research.

It was said in Sao Paulo that the decree signed by Marin transferring the IPEN to the federal area would be published yesterday in the DIARIO OFFICIAL, which in fact did not occur. The governor himself did not report on that decision and the superintendent of IPEN, Hernani Amorim, refused to comment on the matter.

However, IPEN sources are no longer sure about the publication of the decree and deny that that change is connected with the recent case of the radioactive topazes (there was a charge that topazes were irregularly processed in the IPEN reactor, a charge denied by the institute itself (see report above). According to some comments, the IPEN is already operating only for the federal government in the area of nuclear energy and that in such a case it would no longer be subject to the Secretariat of Commerce, Science and Technology of the state government.

Everything will be clarified within the next few days, including the possibility of a certain link being maintained by the IPEN with the Sao Paulo government. The old Atomic Energy Institute was created in 1956 through an agreement between the federal and state governments, with the atomic reactor beginning to operate in 1957 in an area granted by the University of Sao Paulo in University City. Now it is up to Marin to explain why he is taking this decision precisely at the end of his administration.

8711

CSO: 5100/2011

## DURVALDO GONCALVES NAMED HEAD OF IPEN

### Installation Set

Rio de Janeiro GAZETA MERCANTIL in Portuguese 26 Nov 82 p 10

[Report by Paulo Ludmer from Sao Paulo]

[Text] Next Monday, Lt Col Durvaldo Goncalves, Army Engineers, will assume the post of superintendent of the IPEN (Nuclear and Energy Research Institute), replacing Col Hernani Augusto Lopes de Amorim, army chemist. The engineer will come from SESP (Sao Paulo Power Company), where, together with Professor Luis Cintra do Prado, he developed nuclear activities.

On 4 June 1979, as a member of CNEN (National Nuclear Energy Commission), Amorim was attached to the Sao Paulo government at the request of the Ministry of Mines and Energy (MME), through the minister. After 3-1/2 years as superintendent, Amorim released an official note saying he had tendered his resignation to Osvaldo Palma, Sao Paulo secretary of industry, commerce, science and technology, to whom the IPEN was subordinated until 1 November 1982. Amorim's note added that Goncalves was his choice [to replace him]. "The transfer is routine and has the general agreement of CNEN and SICET [Secretariat of Industry, Commerce, Science and Technology], represented by Rex Nazare Alves and Dr Osvaldo Palma," the official note concluded.

At IPEN, Amorim's advisors confirmed that he had wanted for a long time to return to Rio, for private and family reasons. At CESP, however, the general feeling is that Amorim was asked for his resignation because of blemishes in the image of the institute (the topaz case, among others).

At CESP, as engineer of the IME (Military Engineering Institute), Goncalves had been conducting the preparations for Peruibe I and II, after his duties had been cut back with the establishment of NUCON, a subsidiary of NUCLEBRAS [Brazilian Nuclear Corporations], which will turn the nuclear plants over to the concessionary in a "turnkey" operation.

Colonel Goncalves, who attended countless postgraduate courses in nuclear science abroad, still has the reserve of a native of Arguilo (Sao Paulo), where he was born almost 5 decades ago. He is not a politician, but he maintains a cautious reserve. He describes himself as a technician. Very few people know him by name in the CESP. His trademark is discretion, say CESP

public relations officers. What he hopes for the IPEN, administered through CNEN, is to satisfy its personnel by raising salaries to the federal level.

CNEN was given the task of managing IPEN by the national security sector--over the criticism of politicians of the opposition parties--with the rationale that it would save money for the Sao Paulo treasury and pay the staff better salaries. IPEN will be similar to Oak Ridge (United States), a university laboratory administered by third parties. In the United States, Union Carbide manages the property ceded by the university. Goncalves acquired the North American discipline in situ. The Brazilian and the FRG nuclear programs have not had a leader ["cabeceira"] for a long time, says a former comrade-in-arms.

#### New Director

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 28 Nov 82 p 34

[Text] At 1100 hours tomorrow the new superintendent of IPEN will be installed. He is Lt Col Durvaldo Goncalves, Army Reserve. The ceremony will take place in the headquarters of the institute at the City University. The new superintendent is an engineer. He has been manager of the Nuclear Energy Department of the Military Institute of Engineering and director of the Nuclear Energy Department of the Army Directorate of Research and Technical Training.

6362

CSO: 5100/2015

## BRAZIL

### GOVERNMENT, IPEN DENY FEDERALIZATION OF IPEN

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 30 Nov 82 p 16

[Text] Following the installation yesterday of Durvaldo Goncalves as the new director-superintendent of the Nuclear and Energy Research Institute (IPEN), both Osvaldo Palma, [Sao Paulo] secretary of industry, commerce, science and technology, and Rex Nazare Alves, president of CNEN (National Nuclear Energy Commission), denied that the IPEN had been federalized. Both men said it was simply a matter of transferring "the management of activities developed by the IPEN to the CNEN, in accordance with an agreement signed between the governor of Sao Paulo State and the CNEN on 1 November."

To date, the text of the agreement has not been made public. Only a summary of it appeared in the DIARIO OFICIAL DE ESTADO on 16 November, which did not clarify the nature of the move, but technicians in the area guarantee that the governor of the state, represented by the secretary of industry, commerce, science and technology, did not take the initiative in proposing the agreement, but simply agreed to its terms. They say the full text of the agreement should be available at the CNEN in Rio de Janeiro.

Col Hernani Augusto Lopes de Amorim, former director-superintendent of IPEN, said that, under the terms of the agreement signed between the secretariat and the CNEN, governor-elect Franco Montoro will not be able to replace Lt Col Durvaldo Goncalves, the new superintendent installed yesterday, without CNEN approval.

#### Legality of the Move

None of the officials attending the ceremony would comment on the legality of the transfer of the administration of IPEN, a state agency, to CNEN, a federal entity.

However, Colonel Amorim tried to explain that the agreement does not in fact transfer a state agency to the federal union, but only its administration. "For example," Amorim said, "the land and the building occupied by IPEN are still the property of the state."

Also according to Colonel Amorim, who should head the Chemistry Department of the Ilha do Fundao Nuclear Energy Institute in Rio de Janeiro, the only two state nuclear research organizations that will not come under CNEN administration are the Center for Use of Nuclear Energy in Agriculture, an agency

managed by the Luiz de Queros Agriculture School (ESALQ) in Piracicaba, and the Plasma Center of the State University of Campinas (UNICAMP).

#### Brain Drain

CNEN president Rex Nazare Alves declared that, with the transfer of IPEN administration to the federal area, he expects to solve the problem of the brain drain that has been observed in recent years in Sao Paulo. This phenomenon was confirmed by Colonel Amorim, although he would not quantify it. He explained only that the technicians who had left IPEN were working in electronics, metallurgy and data processing, and earning two and even three times as much. The former director-superintendent of IPEN added that the agreement between CNEN and the Secretariat of Industry and Commerce would make it possible for IPEN to pay its specialists at the going rate on the market.

Incoming director Goncalves would not comment on the IPEN plan of activities and budget for the coming year, declaring that, from now on, all such information would be supplied by CNEN in Rio de Janeiro. Before the agreement with CNEN, the IPEN estimated budget for next year was 3.5 billion cruzeiros.

Among those attending the installation ceremony, in addition to Secretary Osvaldo Palma, were Marcelo Damy de Souza Santos, Professor Luiz Cintra do Prado and Romulo Pieroni, former IPEN superintendents, and Jose Geraldo Villas Boas, president of the CESP (Sao Paulo Power Company).

6362

CSO: 5100/2015



# CONSTRUCTION OF URANIUM EXPLOITATION PLANTS TO BEGIN IN 1983

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 25 Nov 82 p 32

[Text] Brasilia--Minister of Mines and Energy Cesar Cals announced yesterday that early next year construction will begin on a pilot plant for the exploitation of uranium in Itataia, in Ceara. Itataia is the largest uranium reserve in the country, estimated at 137,500 tons. However, the ministers and his aides did not want to reveal the amount of the investments to be made in the pilot plant the operation of which is scheduled for 1984, nor its initial production capacity.

Cals also revealed that the development of the uranium exploration program in Lagoa Real, in Bahia, is assured. In 1983 excavation work and the construction of galleries will be carried out in that deposit, the reserve of which is estimated at 63,000 tons of uranium. The minister, likewise, did not reveal the amount of investments in that project, stressing on the other hand the 100 jobs to be generated on the construction of the pilot plant in Itataia and 200 more in Lagoa Real.

The Itataia plant will test the technology developed by the Brazilian Nuclear Corporation (NUCLEBRAS) for the separation of uranium and phosphate. Those two minerals are associated in that deposit and, according to ministry experts, it is the NUCLEBRAS technology that will identify whether the quantity of uranium is greater or less than that of phosphate. The minister explained also that the work of excavation and construction of galleries in Lagoa Real represent the first stage of the installation of a mining-industrial complex for the production of uranium concentrate. The first uranium concentrate plant in Pocos de Caldas (Minas Gerais) has been operating since the beginning of the year and, according to the experts, will supply the product, enriched by the Urenco consortium (comprised of Great Britain, the Netherlands and France), to the nuclear plants until 1992. The experts explained also that it has not yet been determined which reserve--Itataia or Lagoa Real--is the most feasible technically and economically for the industrial-scale exploitation of uranium. Lagoa Real is the second largest uranium reserve in the country and Pocos de Caldas is the third, with 26,800 tons. The overall uranium reserves of Brazil amount to 140,000 measured tons and 125,800 estimated tons.

8711

CSO: 5100/2011

## FINAL PREPARATIONS MADE FOR RESUMPTION OF ANGRA-I OPERATIONS

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 25 Nov 82 p 32

[Text] Rio--Furnas is making final preparations to put into operation by the 29th of this month the nuclear reactor of its Angra-I plant shut down due to a number of problems and equipment defects. In putting the reactor into operation for the first time, Furnas will bring it up to a power of 50 percent, that is, 300 megawatts, after a short period of tests in the operational area of 30 percent load, aides of that state company revealed yesterday.

The Angra-I reactor had been at a standstill due to defects in the auxiliary safety system where two diesel generators were broken down. With the arrival of U.S. technicians from the company that built those generators (Fairbanks Morse), who made the necessary repairs, Furnas can again perform the load and performance tests on the equipment of its reactor.

With the authorization granted by the National Nuclear Energy Commission (CNEN) for the tests at 50 percent power, Furnas will put the reactor into operation for a period of 3 months, after which it will be shut down again, this time awaiting the definitive repair of the manufacturing defect that arose in the steam generation system. The entry into commercial operation of the Angra-I reactor can only be made in October 1983, representing a forced stoppage of 2 years thanks to that error in structural conception on the part of Westinghouse. This 2-year delay represents a loss to Furnas of \$260 million in financial costs alone on financing obtained abroad for construction of the plant. According to the aides to the president of Furnas, the Brazilian company did not pay the sums corresponding to the last installments owed to Westinghouse as a way of guaranteeing the repair and perfect operation of the reactor. The manufacturing defect of the Angra-I reactor affected a number of other Westinghouse reactors, such as those of Almaraz (Spain), Krsko (Yugoslavia), Ringhals-III (Sweden), McGuire (United States), and others. In accordance with the negotiations with Westinghouse, the experts and technicians of the U.S. company are going to come to Brazil in March 1983 to make the necessary repairs of the two preheaters of the steam generation system. The inclusion of that preheater, which was not in the original plan, was made to increase the reactor's yield, according to Westinghouse. However, the preheaters began to show cracks and leakage of radioactive liquid from the cooling system, causing all of those reactors in various countries to be put in quarantine awaiting a technical solution and the consequent repair by Westinghouse.



BRIEFS

THREE-PLANT LIMIT RECOMMENDED--The report containing the final conclusions of the CPI-NUCLEBRAS [Congressional Investigating Committee-Brazilian Nuclear Corporation] will be submitted next Tuesday for consideration and approval in full session, it was announced yesterday from the chair of the chamber. The report, drafted by Senator Milton Cabral (PDS-PB [Social Democratic Party-Paraiba]), the CPI reporter, presents several recommendations regarding the Brazilian nuclear program, including reduction of the number of plants to three units. Commenting on the matter yesterday, Senator Dirceu Cardoso (PMDB-ES [Party of the Brazilian Democratic Movement-Espirito Santo]), a member of the committee, observed that the government is respecting almost all the suggestions offered in the final report. This revelation led Senator Jose Fragelli (PMDB-Mato Grosso do Sul) to make a speech stressing the importance of the participation of the legislative branch in solving Brazil's problems. In his opinion, the government has "much to gain" by valuing congress more highly, instead of excluding it from the great national decisions. In his speech yesterday, Cardoso recalled that 22 secret documents on the Brazilian-FRC nuclear agreement and the establishment of the nuclear program had been discovered. He asserted that not even Paulo Nogueira Batista, president of NUCLEBRAS, knew the contents of these documents. [Text] [Sao Paulo O ESTADO DE SAO PAULO in Portuguese 27 Nov 82 p 25] 6362

CSO: 5100/2015

PRESIDENT SIGNS LAW APPROVING NUCLEAR AGREEMENT

PA210050 Bogota Domestic Service in Spanish 1730 GMT 20 Dec 82

[Text] Bogota--President Belisario Betancur has approved law No 47 of 1982 on an agreement between Colombia and the International Atomic Energy Agency dealing with the application of safeguards, as provided for in the treaty for the prohibition of nuclear weapons in Latin America. In this agreement, which is now part of the law, Colombia agrees to the application of safeguards on the raw material and special fissionable material used in all peaceful nuclear activities carried out in areas under Colombia's jurisdiction or control, so that it may be verified that this material is not used to make nuclear weapons or other nuclear explosives.

The law notes that the specific objective of the safeguard procedures established in this portion of the agreement is the timely discovery of any diversion of large quantities of nuclear materials from a specific nuclear facility for the construction of nuclear weapons or explosives for undeclared purposes. The law is also intended to discourage attempts at such diversion by maximizing the chances of early discovery.

The law specifies that the International Atomic Energy Agency will take every necessary precaution to protect the [words indistinct] and any confidential information it gains access to in the implementation of the agreement.

To implement these safeguards, the government will concentrate on verification procedures in each phase of the manufacture of nuclear fuel and in the production, treatment, use and storage of nuclear materials that could be easily used to make nuclear weapons or explosives, while (?reducing) to a minimum the verification procedures for other nuclear materials, as long as this will not obstruct the agency's application of safeguards under the agreement.

CSO: 5100/2019

## BRIEFS

NUCLEAR ENERGY USE WITH CSSR--Cuba and Czechoslovakia have signed a protocol in Prague for scientific and technical cooperation in the peaceful use of nuclear energy. The protocol was signed by Fidel Castro Díaz, executive secretary of the Cuban Atomic Energy Commission, and his Czechoslovak counterpart, (Stanislav Havel). This cooperation plan is directed at the use of experimental nuclear reactors, at the exploitation of nuclear energy in medicine and agriculture and at the training of Cuban specialists in Czechoslovakia. The joint work plan will be in effect the next 2 years, beginning on 1 January 1983. [Text] [FL111711 Havana Domestic Service in Spanish 1100 GMT 11 Dec 82]

CSO: 5100/2018

## TROMBAY PLUTONIUM PLANT DECOMMISSIONING REPORTED

Calcutta THE STATESMAN in English 15 Nov 82 p 11

[Text] New Delhi, Nov. 24--The plutonium plant in Trombay which was heavily contaminated after years of operation has been successfully decommissioned, according to the Department of Atomic Energy, reports PTI.

The plant was commissioned in 1964 to reprocess spent fuel from the Canadian built "Cirus" reactor in Trombay. The plutonium for the nuclear device exploded in Pokhran in May 1974 came from this plant.

The Atomic Energy Department said that during the number of years of operation, the process equipments and piping were constantly exposed to corrosive environment.

Hence "it was considered desirable to decommission the plant for effecting necessary replacements to extend its life" the department said. The decommissioning programme was planned to keep the personnel radiation exposures as low as possible.

High pressure water jets, steam, chemicals, pneumatic and "chippers" were used to decontaminate and reduce radiation to a level permitting unrestricted entry of personnel into the plant for carrying out fresh installations. Most of the "cells" were salvaged but piping and those equipment that could not be salvaged were disposed of.

"The entire decommissioning and salvaging operations involved a dose commitment of about 2000 man-rem spread over three years" according to the department. Rem is a unit of radiation dose.

The department, however, did not reveal how much radioactive effluents were released during the decommissioning operations, how they were disposed of or the cost of this operation. All nuclear facilities must be decommissioned at the end of their life to prevent them from being a hazard to the public.

Since 1960 more than 65 nuclear research reactors have been decommissioned. The Trombay plutonium plant is the first Indian nuclear facility to have been decommissioned.

The confidence gained in this exercise "would enable effective decommissioning of the nuclear facilities in the future as and when the need arises" the department said.

The Tarapur atomic power station will be ready for decommissioning by the end of the century.

CSO: 5100/7032

## ATOMIC POWER PLANT EQUIPMENT TO BE STANDARDIZED

New Delhi PATRIOT in English 30 Nov 82 p 2

[Text]

The department of atomic energy has proposed to standardise the designs for major equipment required for atomic power plants and place bulk orders to avoid delay in completing project schedules, reports UNI.

In India, the gestation period of an atomic power plant is estimated around nine years. One of the important factors affecting the project schedules at present is the delayed delivery of major equipment. For overcoming this restraint, it is proposed to standardise the designs and place bulk orders to enable manufacturers to mobilise their resources more efficiently, according to official sources.

The delay in completion of the atomic power plants leads to cost escalations.

In the case of Narora Atomic Power Plant (NAPP) in Uttar Pradesh, which is considered the reference design for future stations, the increase of Rs 106.5 crores over the original estimate of Rs 200.9 crore in 1973-74, which comes to Rs 378.4 crore at 1980 prices is broadly attributable to factors like escalation of Rs 113.7 crore design changes Rs 22.5 crore, increase in scope of quantity Rs 22.6 crore, and new works Rs 7.7 crore.

It was explained that the design changes were necessitated

by seismic considerations scaling up the size of certain equipment for the adaptability for future 500 MW stations planned.

Increasingly stringent safety criteria have resulted in additional expenditure of Rs 45.1 crore.

The increase in the investment costs of Rajasthan Atomic Power Station and Madras Atomic Power Project (MAPP) apart from general inflation were mainly due to increase in scope of works, augmentation of heavy water upgrading facilities and increase in cost of fuel and heavy water.

The sources said that the capital

costs of thermal power stations in India have risen sharply in recent years, mainly due to sharp increases in the prices of equipment. The average cost of thermal projects commissioned last year was about Rs 4,300 per KW installed against Rs 2,500 per KW for projects completed five years earlier.

The ongoing projects for which equipment were ordered recently or were yet to be ordered are estimated to cost about Rs 6000 per KW to Rs 7500 per KW the capital costs of projects being planned now are in the range of Rs 7000 to Rs 7300 per KW depending on the site and size of station and units.

## PROBLEMS, RISKS SEEN IN TARAPUR ACCORD

Madras THE HINDU in English 1 Dec 82 p 8

[Editorial: "Problems and Hidden Risks in Tarapur Accord"]

[Text]

THE OFFICIAL "UNDERSTANDING" reached with France on nuclear fuel supply to Tarapur does reflect the resistance put up by the Indian negotiators (reportedly on political instructions from the very top) to the unreasonable "non-proliferation" demands imposed by the London club of suppliers, to which the West European country belongs. Nevertheless, a scrutiny of the precise details (as published over the past couple of days in this newspaper) suggests there is nothing to be euphoric, much less enthusiastic, about. It might be argued that India kept out of the text of the accord any implication that it had given in to, or would concede in the future, the demand that it swallow in the case of an atomic power station covered by a second-generation (1963) nuclear cooperation agreement terms that are incorporated as a matter of standard formula in virtually every third generation agreement. The sticking point in the Indo-French attempts to reach an accord was clearly the "perpetuity" issue — a concept laid down in the document adopted by the Board of Governors of the International Atomic Energy Agency in 1973, known as GOV 1621. The Indian interpretation of the relevant section of the 1963 Indo-US agreement for nuclear cooperation has, from the very start, ruled out any "in perpetuity" application of the external safeguards and other restrictions on Tarapur. In fact, Article VI (a) of the agreement states: "The Government of India emphasises, in contrast to the position of the United States, that its agreement to the provisions of this Article in relation to equipment or devices transferred pursuant to this Agreement has been accorded in consideration of the fact that, as provided in this Agreement, the Tarapur Atomic Power Station will be operated on no other special nuclear material

than that furnished by the Government of the United States of America and special nuclear material produced therefrom, in consequence of which the provisions of this Article in relation to equipment or devices in any case ensue from the safeguards on fuel" (emphases added). Through the negotiations with the U.S. in 1981 and with the French in 1982, the basic Indian position has been that the 1963 agreement is — quite unlike third generation nuclear supply relationships — a time-bound affair postulating a quid pro quo (no supply, no obligations). Naturally, neither of the nuclear suppliers has accepted this position.

The United States has insisted that its rights covered by the original agreement — in which it is now a sleeping but hardly-to-be-ignored partner — continue and will continue indefinitely; the practical meaning of this is that any attempt to remove IAEA safeguards from Tarapur will invite some kind of economic and political sanctions (starting with the guillotining of EXIM credits). The French Government has consistently maintained that it is coming into the picture as a conscious member of the London Club, a position reiterated by President Mitterrand in his press conference in New Delhi. During the rounds of negotiation that have followed the announcement of the skeletal accord in Washington, the French side has reportedly wanted India to conclude a separate agreement with the IAEA to cover the new supply relationship, to treat the fuel as "leased" (to be taken back by the supplier), to commit itself firmly to a resolution of the disagreement over the terms (chiefly the question of what would happen to the safeguards and other restrictions on the spent fuel and derivative material after 1993) and so on. A caving in to these demands

has been avoided, with advantage taken of the political side of the developing Indo-French relationship and presumably of such sources of economic leverage as the Mirage deal (which, according to a formal response by Mr. Mitterrand, bears no link whatsoever with the accord on Tarapur). But does not the success of the accord reflect essentially a blurring of the issues,

an artful ambiguity worked into the text? The new relationship will be "within the framework of the 1963 agreement" and France is coming in as a supplier "in lieu of the U.S.," nevertheless the most significant part of the accord stipulates: "During the life of the 1963 agreement France and India shall consult with a view to agreeing on the arrangements to ensure the implementation as may be necessary of the provisions of the preceding paragraphs." And this, according to Mr. Mitterrand's public interpretation, means consultations to decide on all the arrangements relating to the use of spent nuclear fuel and its derivatives after 1993.

It is here that one risky problem lurks. Who is to resolve the differing interpretations, when the time for action and the removal of the unwanted safeguards comes? What kind of control or rights will the London Club member(s) see over the derivative special nuclear material? What will be the attitude of the IAEA, whose current leadership all but swears by the principle of discrimination in nuclear transactions? And will there be any international law ramifications sought to be invoked when India asserts its claim that the external restrictions cannot continue "in perpetuity"? Another kind of problem is presented by the fact that the deal with France on Tarapur — the horizon for which is fairly short — seems to provide the methodology (or opportunity) for the U.S. to preserve its "rights" with respect to Tarapur. While discussing the policy implications of the fresh arrangement for Tarapur, it should not be forgotten that the obstruction to India's reprocessing of the accumulated spent fuel has not been lifted by Washington — despite a promise held out on this contentious issue in the 1981 negotiations.

CSO: 5100/7037



## IAEA APPROVAL FOR TARAPUR AGREEMENT NOT VITAL

Bombay THE TIMES OF INDIA in English 4 Dec 82 p 9

[Article by L. K. Sharma]

[Text]

NEW DELHI, December 3.

**W**HILE a section of the western press has accused France of nuclear profligacy for having agreed to supply nuclear fuel to India, observers here are more interested in the reaction of the International Atomic Energy Agency (IAEA), which has to be formally notified of the change of supplier.

The IAEA comes into the picture because France is replacing the U.S. as the fuel supplier within the framework of the Indo-U.S. agreement of 1963 as well as the trilateral agreement of 1971 involving India, the U.S. and the IAEA.

The concerned countries — India, the U.S. and France — have confirmed that the old agreement involving the IAEA would remain in effect. This rules out the need for these parties approaching the IAEA again for a fresh agreement.

They feel that all that is required to be done is to notify the IAEA that France has replaced the U.S. as the supplier since it is the IAEA that implements the safeguards.

The diplomatic notes exchanged between India and the U.S. make it clear that the trilateral agreement involving the IAEA will remain in effect.

The IAEA may take interest in the French position on fuel supplies to India since the London club guidelines to which France is committed as a member country had been formally conveyed to the IAEA.

Generally, under these guidelines, France could not have supplied fuel to India without insisting on more severe safeguards. However, France after taking legal opinion on the issue came to the conclusion that it

need not conform to the London club guidelines since its role was essentially that of a "substitute supplier" under the Indo-U.S. agreement which was older than the London cartel of fuel suppliers.

The largely identical diplomatic notes exchanged between India and the U.S. will have the effect of enabling India to receive supplies of fuel from France since the Indo-U.S. agreement envisaged no other supplier except the U.S. These notes release the U.S. from its obligation to supply fuel.

Significantly, an additional line in the U.S. note says: "The government of the United States also waives its right under the agreement for co-operation that the Tarapur atomic power station be operated on no other special nuclear material than that made available by the United States."

The next line in the U.S. note, identical to the one in the Indian note, says: "It is understood that the government of India will in the future, unless otherwise mutually agreed by the governments of the United States and India, obtain all its requirements for enriched uranium containing no more than 20 per cent U-235 for fuel for Tarapur atomic power station from the government of France and that the Tarapur atomic power station may be operated on such fuel."

This makes it clear that India on its own cannot change the supplier or decide to use indigenous fuel for Tarapur even though the U.S. has been freed of its obligation to supply

the nuclear fuel. "Mutual agreement" will again be required for India taking such a course.

In effect, while the U.S. will retain its say in Tarapur affairs even after passing on its responsibility to

France, India will also have to consult France which is coming in only as a substitute supplier.

This is because the agreement with France says that "during the life of the 1963 agreement (between India and the U.S. which will be in effect till 1993), France and India shall consult with a view to agreeing on arrangements to ensure the implementation as may be necessary of the provisions in the Indo-French agreement."

In his press conference here, the French President, Mr. Francois Mitterrand, had also emphasised the "consultation" clause even in relation to India's right to reprocess the spent fuel.

He did not say that under the agreement, it was a matter only between India and the U.S. and that France as a substitute supplier was not involved in this aspect.

Under the new arrangement, India will thus be obliged to have consultations with the U.S. as well as France and will have to tackle two parties should any difficulties arise over the interpretation of provisions.

Meanwhile, commercial negotiations for the purchase of enriched uranium will take place soon between India and France. The supplies will start as soon as the contract with the concerned public-sector firm is signed.

PTI adds: The delay in France signing the agreement for the supply of nuclear fuel to the Tarapur atomic plant was possibly due to a "misunderstanding", according to Dr. H. N. Sethna, chairman of the atomic energy commission.

In an interview broadcast over All India Radio, Dr. Sethna said that in the London club rules, which some nuclear powers observed, there was also a clause that if one was dealing with an old contract or an old agreement then the London club permitted that old agreement to stand.

## PRASAD SPEAKS IN UNGA DEBATE ON IAEA REPORT

New Delhi PATRIOT in English 20 Nov 82 p 3

[Text]

UNITED NATIONS, Nov. 20.  
(PTI)

INDIA yesterday introduced in the UN Political and Security Committee a resolution proposing a freeze on nuclear weapons.

The resolution, which was introduced by former Union Minister Dr Charanjit Chanana calls upon all nuclear weapon States without exception to agree to a freeze on nuclear weapons and a simultaneous cut-off in the production of fissionable material for weapons purposes.

During Thursday's deliberations of the committee, the United States had called the Indian draft (it had been circulated earlier) as "sweeping" and said a freeze on nuclear weapons would not, under the present circumstances, lead either to nuclear arms reduction or to a safer world.

The Netherlands representative yesterday said the idea that negotiations were necessary in relation to a freeze was conspicuously absent in the Indian draft.

There are as many as 64 draft resolutions before the committee on disarmament-related items and voting on them will start on Monday.

Commending the Indian resolution to the committee, Dr Chanana said nuclear weapons, as weapons of mass destruction, must be limited, reduced and eliminated wherever they existed.

He said the freeze on nuclear weapons must be followed immediately by negotiations on the reduction and subsequent elimination of all nuclear weapon stockpiles.

In those negotiations, regard must be taken of the relative qualitative and quantitative importance of the existing arsenals of the nuclear-weapon States.

Dr Chanana said the text focused attention on the production of nuclear weapons and the production of fissionable material for weapons purposes, and excluded additional elements such as the problems of verification and control, or the cessation of the testing of nuclear weapons, because there were other resolutions before the committee which addressed those particular elements.

Referring to the draft on nuclear freeze presented by Mexico and Sweden, Dr Chanana said India had no difficulty with that proposal, which was entirely in harmony with that of his country, and he fully supported it.

However, he believed that a freeze on nuclear weapons should be agreed upon by all nuclear weapons States and that, in the interests of simplicity and ease of implementation, should, in the first instance, cover the elements of production of nuclear weapons and the production of fissionable material for weapons purposes.

Dr Chanana announced that his delegation was withdrawing a draft resolution it had proposed calling for "urgent measures for the prevention of nuclear war and for nuclear disarmament". The measures contained there had already been covered in separate draft resolutions, and he felt that any unnecessary duplication should be avoided, he said.

## PLANS, PURPOSE OF IAEA CHIEF'S VISIT TOLD

Madras THE HINDU in English 26 Nov 82 p 9

[Article by G. K. Reddy]

[Text]

NEW DELHI, Nov. 25.

The Director-General of the Vienna-based International Atomic Energy Agency (IAEA), Dr. Hans Blix, is visiting India next week after the Mitterrand visit to acquaint himself with the country's nuclear problems.

Though his visit has nothing to do with the protracted Indo-French talks on the supply of nuclear fuel for the Tarapur plant, Dr. Blix will certainly utilise the opportunity, during his talks in Delhi and Bombay, to get a clearer idea of the Indian position.

As Director-General of IAEA he continues to take a fairly tough stand on the question of safeguards, insisting on the application of both pursuit and perpetuity clauses to the French-supplied fuel as has been done in the case of the heavy water sold by the Soviet Union.

Talks on proliferation: During his week-long stay in India, he will be visiting various nuclear establishments in the country, besides having talks with the Prime Minister, Mrs. Indira Gandhi, the External Affairs Minister, Mr. P. V. Narsimha Rao, the Chairman of the Atomic Energy Commission, Mr. H. J. Sethna and others on problems of proliferation.

It remains to be seen what stand IAEA will take if France veers round to the Indian view that, as part of an on-going arrangement, the French assumption of responsibility for the supply of enriched uranium during the remaining 10 years of the 1963 Indo-U.S. agreement is treated as part of the existing obligations which are outside the purview of the more stringent safeguards now being applied by IAEA on new nuclear transactions.

It is open to IAEA to create a crisis by refusing to enforce the old safeguards in protest against the Indian refusal to submit to stricter conditions. It is not known whether the U.S. and France have had any confidential exchanges on the subject with Dr. Blix before suggesting the new fuel supply arrangement.

UNIDO official's visit: Meanwhile, another important U.N. functionary who is visiting India next week is the Executive Director of the United Nations Industrial Development Organisation (UNIDO), Dr. Abd-El Rehman Khene, on his way to Nepal for the solidarity meeting of cooperation in its industrial development. The main purpose of his visit to India is to press for India's support for his re-election next year.

Asen's campaign: A ticklish problem that India is facing at the moment, as next chairman of the Non-Aligned community, is the campaign that the Association of South-East Asian Nations has launched to secure an invitation for Prince Norodom Sihanouk to the forthcoming summit in his capacity as head of the Provisional Government of Kampuchea set up by him.

The argument that is being advanced by Asen is that, as the only surviving founder of the Non-Aligned movement, he should be invited in his personal capacity to address the summit conference.

But India is opposing the suggestion with the argument that, if an exception is made in the case of Prince Sihanouk, a similar courtesy will have to be extended to Mrs. Simrevo Bendarasika who has been equally closely associated with various stages of the movement.

Seat should remain vacant: The Indian position is that until the issue of Kampuchean representation is amicably settled, the seat should be kept vacant following the procedure adopted at the 'ast summit in Havana, while Asen wants to follow the U.N. pattern if possible.

The Government is sending out a number of senior emissaries to various countries to discuss all such sensitive issues and ensure that there is no clash during the conference.

The Indian position is that, though it has taken a national stand that the Heng Samrin government is in full control of Kampuchea and entitled to recognition, it has no intention of misusing its chairmanship of the Non-Aligned summit to pre-judge the issue.

It does not also propose to allow the supporters of the Sihanouki government to work up a consensus in favour of inviting it. The consensus at the Non-Aligned conferences, it is pointed out, is not harnessed on the basis of majority support, but a degree of near unanimity that is broadly acceptable to the movement.

CSO: 5100/7033

## INDIA INTRODUCES NUCLEAR FREEZE RESOLUTION IN UN

New Delhi PATRIOT in English 21 Nov 82 p 3

[Text]

/ UNITED NATIONS, Nov 19 (PTI)—It is only with a nuclear freeze that an effective and economical safeguards system could be devised on the basis of objective, scientific and non-discriminatory criteria, India has told the United Nations.

Speaking in the debate in the General Assembly yesterday on the report of the International Atomic Energy Agency for 1981, Indian delegate, Jitendra Prasad, (MP) said a freeze must provide for a complete cessation of manufacture of nuclear weapons and a cut-off in the production of fissionable material for weapon purposes.

Such a combined step, he said, would mean that all nuclear facilities in all countries, in the world would become peaceful, 'and in that event nuclear weapon States could have no excuse or pretext for refusing to accept international safeguards which they were presently asking the non-nuclear weapon States to accept in the name of so-called full-scope safeguards.

Mr Prasad reiterated India's view that safeguards in the nuclear weapon States on only certain self-selected facilities did not serve any purpose.

He said, as long as the nuclear weapon programme in nuclear weapon States continued unabated and unchecked, such formal safeguards could have little or no meaning, were wasteful of the meagre resources of the IAEA and tended to legitimise non-peaceful uses of nuclear energy in the weapon States. . .

CSO: 5100/7030

## UN DELEGATE OPPOSES LIMITED NUCLEAR-FREE ZONES

New Delhi PATRIOT in English 28 Nov 82 p 3

[Text]

UNITED NATIONS, Nov 27 (PTI) India has reiterated at the UN its opposition to the idea of nuclear free zones in selected areas of the world.

The phenomenon of nuclear arms race both in its quantitative and qualitative aspects is fundamentally incompatible with the concept of creating nuclear free zones, Indian representative Shyam Saran told the political and security committee yesterday.

Mr Saran restated India's position while voting against a resolution sponsored by Finland proposing a review and supplement of the comprehensive study of the question of the nuclear weapons free zone undertaken in 1978.

Mr Saran said experience accumulated since 1978 had clearly demonstrated that the concept itself had become obsolete. The Indian Government was convinced that the nuclear weapon free zone idea had become both impractical and unrealistic.

"We cannot subscribe to the legitimisation of the possession of the nuclear weapons by a few powers by agreeing to live under their professed benign protection in the guise of a nuclear weapon free zone," the Indian representative said.

The resolution was adopted by the committee with only India voting against it.

The committee adopted a number of other resolutions on disarmament one of which sponsored by India and several non-aligned countries was on the prevention of an arms race in outer space.

CSO: 5100/7035

# TEXT OF NUCLEAR FUEL AGREEMENT WITH FRANCE

Bombay THE TIMES OF INDIA in English 28 Nov 82 p 1

[Text] New Delhi, November 27—The bilateral agreement under which France will supply enriched uranium to India for the Tarapur atomic power station has vindicated India's stand that as a substitute supplier in the place of the U.S., France must follow the Indo-U.S. agreement of 1963 and not insist on additional safeguards.

The agreement, signed after midnight last night, ends the uncertainty regarding the operation of the Tarapur plant at full capacity and frees the U.S. of its obligation to supply enriched uranium. France will take the place of the U.S. as fuel supplier since the Reagan administration was unable to because of its domestic laws.

Notwithstanding a trilateral understanding reached during the Prime Minister's visit to Washington in July last, France came up with conditions regarding additional safeguards and held out for four months before finally conceding India's point of view on the eve of the French President, Mr. Francois Mitterrand's visit here.

The fuel supplies from France will now come within the framework of the Indo-U.S. agreement of 1963 and the trilateral agreement of 1971 involving India, the U.S. and the International Atomic Energy Agency (IAEA) which implements the safeguards at the plant.

The Indo-French agreement thus contains no additional safeguards in the form of "pursuit and perpetuity clauses" that would have compromised India's position. The Tarapur agreement signed between India and the U.S. expires in 1993 and thus Tarapur will be free of international safeguards after the expiry of the agreement.

Earlier, French conditions would have perpetuated the safeguards irrespective of the expiry of the agreement. This was rejected by India in no uncertain terms.

The so-called pursuit clause has not been incorporated in the three-para Indo-French agreement. Such a clause means that any material or by-product from Tarapur going to any other facility would carry with it safeguards to the other centre, which may otherwise be free of safeguards.



## Text of Agreement

However, since India is not interested in diverting any foreign nuclear material from Tarapur for any other use, it agreed to accommodate the French view by agreeing to include a specific line in the pact draft to this effect.

The three-para agreement signed by the chairman of the Atomic Energy Commission, Dr. H. N. Sethna, and the French ambassador here, Mr. Andre Ross, was released here at a joint press conference.

Mr. Ross himself was at hand to explain why France decided to ignore the London Club guidelines which require his country to insist on more severe safeguards before committing any supplies. His explanation was: "Legal advice." His argument was that the London Club of nuclear suppliers was formed long after the Indo-U.S. agreement was signed and was being implemented.

The Indian spokesman said India was entirely satisfied with the agreement.

The text of the agreement is: "within the framework of the 1963 agreement for co-operation between India and U.S., France in lieu of the U.S. has agreed to supply enriched uranium for the Tarapur plant. India shall use the special nuclear material supplied by France or by-products derived from it only for peaceful purposes and research in and production of electrical energy, as had been provided for in the said agreement.

"This commitment shall be subject to the safeguards provided for in the 1963 co-operation agreement between India and the U.S. and in the 1971 trilateral agreement between the U.S., India and IAEA.

"During the life of the 1963 agreement, France and India shall consult with a view to agreeing on the arrangements to ensure the implementation as may be necessary of the provisions of the preceding paragraphs."

CSO: 5100/7034



## ATOMIC ENERGY HEAD DISCUSSES FUEL AGREEMENT

BK031719 Delhi Domestic Service in English 1 Dec 82

[Atomic Energy Commission Chairman Dr H. N. Sethna interview with K. C. Khanna, editor of THE ILLUSTRATED WEEKLY OF INDIA -- recorded -- date not given]

[Text] [Question] Mr Sethna: While you deserve happiest congratulations for signing the agreement with the French for the supply of nuclear fuel for the Tarapur plant till 1991, the public is a bit perplexed as to why did the French first agree, then raise objections and finally agree.

[Answer] Well, first of all I would like to point out that this was a team effort and the one advantage, if you want to call it that, the Indian side had was that the talks were taking place in India, in Delhi. So, we were able to have the advice of our prime minister right through and also of our external affairs minister, and that helped us a lot.

Now, coming to the second part of your question as to why France had first insisted on certain conditions which were beyond the 1963 agreement, I think it was more of a misunderstanding in the sense that in all contracts for the supply of enriched uranium for Tarapur, the French Government had to follow what is called the London Club rules. But in the London Club rules there is a clause which says that if it is an old contract, an old agreement, then the London Club permits that the sale agreement stands. Now it is up to the country which is supplying the material to work out its differences with the rest of the members of the London Club. The point at issue was...[interrupted by questioner]

[Question] Are you saying in effect that the French Government took a lot of time to negotiate the agreement with the rest of the members of the London Club, because as far as we are aware the French Government never consulted any other member of the London Club.

[Answer] No, they have to be sure within their own bureaucracy and the government that what they were doing was right. That is to say they were taking up an agreement which had been signed in 1961. They cannot possibly apply the rules which apply now in 1982. This actually took some time.

[Question] Now going back to the beginning, the problem arose in the first place because the U.S. Government (backed out) on a contractual commitment which had a force of a treaty. They were bound to supply us nuclear fuel for the (functioning) of the plant and this agreement implied that they will give us the rest of the fuel in the quantity that is needed to run the plant to capacity and at the time that it is needed. They delayed and delayed. Do you think, in this respect, we were wise or we

were unwise not to terminate the contract long ago?

[Answer] Termination of any agreement which has the force of a treaty, as you said, has many ramifications. [Words indistinct] ramifications in the sense that one has to look at the whole gamut of the Indo-U.S. relations, not merely at Tarapur. And if you look at that, after all the Tarapur fuel as such per se was worth about a few million dollars, nothing very much, and to create problems would have been felt. [sentence as heard] I do not think it would be diplomatic enough to have a sort of break on a thing like this. It was best that we talked and now, of course, the solution is there, so I think everybody is happy over it.

[Question] Forgetting the overall relationship for a moment, would it have been better from the point of view of the development of nuclear energy and energy itself, after all we have been running the Tarapur plant at below capacity for some time now?

[Answer] Yes, but supposing we had gone in for an alternative? There were two alternations for us. One is that we buy enrichment from somewhere else. That would mean a new contract, a new arrangement, a new agreement with the IAEA.

[Question] Was it not easily available?

[Answer] No, no, wait a minute, that would mean again that the safeguards would be in perpetuity. That is whether the agreement is there or not, the safeguards would continue on the produced plutonium. That is the first alternative.

The second one is: If we had run it on the mixed oxide, we had enough from the (?irradiated) fuel we could have run the reactor for about 5 to 6 years, not more. And then what could we have done? So, we have to take an overall view. The plutonium from Tarapur and [word indistinct] from Tarapur meant that we would use it for (?inside) Tarapur, for the next 5 or 6 years. After that there were two alternatives open to us. We can use Rajasthan plutonium or some other plutonium. But to burn plutonium in a thermal reactor, to use it in a thermal reactor is not the most efficient way of using plutonium. Plutonium is best used in a fast system. That much is certain. So, whenever we are ready with the mixed oxide plant, and we will, I hope, sometime later on put in a few bundles of mixed oxide to [words indistinct] in a Tarapur-type reactor with all the, shall I say, problems which are inherent in any power station being run in India at present. [Words indistinct] great fluctuations and the whole host of other things, so the fuel sees many shocks. Now, we have to run it under those circumstances. [Words indistinct] of oxide uranium in research on developing our mixed oxide fuel as well as a plant and equipment to manufacture it.

[Question] Now we are going to use it only for experimental purposes?

[Answer] No, no no, no. We will use that in the mixed oxide plant, if available, also for making mixed oxide fuel for fast reactors. It is a plant which can handle anything from Tarapur to a fast breeder reactor [FBR]. We have a lot of elasticity in that plant.

[Question] So, it will not be a waste?

[Answer] Oh no, definitely not and I remember this much that we built it at a time and at a price where, you know, every year there is an escalation of about between 5 and 10 percent. So, I think we have done the right thing in doing it now.

[Question] Homi, are you confident that the French are reliable suppliers? Are they more reliable or are they not likely to be as unreliable as the Americans were? After all, the FBTR [fast breeder test reactor], they are under contract to supply us fuel for FBTR -- the fast breeder reactors. For 2 years they have not done so. Our reactor is ready to go but for want of the fuel it is not running, it is lying idle.

[Answer] No, I would not say that. Let me divide the question into two parts. First of all, we should talk about the Tarapur business. I will go into the FER later on. But as far as Tarapur is concerned, you must remember that the (Urodict) plant has got tremendous capacity and may not shut down at the moment because there were too much of the enriched stuff with them.

[Question] Yes.

[Answer] So, I don't think that we will have any problem in getting enriched uranium which is only, about what, maximum 2.67 percent enriched mix up to 1993. But, coming to FER, you know, we want a stuff which will be 86 percent which is equivalent to 96 percent enriched and that is a different story.

[Question] Yes, that is a different story, all right. But, they were under contract and they have (?not acted) on it.

[Answer] Well, shall I say, the final approval did not come through, let us put it that way. And the prices were pretty steep.

[Question] All right, you insist on being diplomatic tonight. But, nonetheless, you have to be congratulated for pulling off this deal which was very difficult.

[Answer] I did not pull off any deal; we just worked in a normal way.

[Question] But with the help of the External Affairs Ministry, in this case.

[Answer] And everybody -- prime minister, the External Affairs Ministry, the prime minister's principal secretary, the Cabinet secretary, all of us were in it together.

[Question] Thank you Homi.

CSO: 5100/4319

INDIA

**ISI GIVES DETAILS ON NUCLEAR REPROCESSING PLANT**

**BK101516 Delhi ISI Diplomatic Information Service in English 1501 GMT  
10 Dec 82**

[Text] The Department of Atomic Energy has undertaken design work for setting up the country's third reprocessing facility to be located at Kalapakkam, near Madras. This is to cater to the needs of the Madras atomic powerplant and fast breeder reactor. According to official sources in India, two reprocessing units are in existence. The reprocessing programme was launched with the design, construction and commissioning of a facility at the Bhabha Atomic Research Centre, BARC

The second facility was set up at Tarapur for the reprocessing of oxide fuels from the Tarapur and Rajasthan reactors. This plant is based on the purex solvent extraction process with a chop and leach head end pretreatment stage. Except for the head end cell, which has provision for remote maintenance of in cell equipment, the concept used for the rest of the plant is direct maintenance with remote decontamination facilities.

CSO: 5100/4319

## BRIEFS

**NO TARAPUR FUEL PROBLEM**--Bombay, Dec. 2--The Atomic Energy Commission chairman, Mr H. N. Sethna, has made it clear that the safeguards evolved by the London Club of Nuclear Powers in 1978--"pursuit" and "perpetuity"--do not apply to the recently-concluded agreement between India and France for the supply of enriched uranium for the Tarapur plant, reports UNI. With this accord, Tarapur will not face any fuel problem till 1993, he observed. Participating in the Spotlight programme of All-India Radio (Bombay station) last night, Mr Sethna, who signed the agreement on behalf of the Government here last week with the French Ambassador in India, expressed happiness that the French ultimately veered round to New Delhi's point of view. In reply to a question by the interviewer, Mr K. C. Khanna, editor, Illustrated Weekly, why France had earlier insisted on certain conditions which were beyond the Indo-U.S. treaty on Tarapur of 1963, Mr Sethna said: "It was more of a misunderstanding." Mr Sethna said the French took time apparently "to be sure within their own bureaucracy and the Government that what they were doing was right." Asked why India did not terminate the Indo-U.S. treaty and explore other alternatives, Mr Sethna said the termination had many ramifications. One had to look at the wide gamut of Indo-U.S. relations and it would not have been wise to break such ties. India could not have approached any other country for the fuel since any fresh agreement would have attracted the two objectionable additional safeguards. [Text] [Calcutta THE STATESMAN in English 3 Dec 82 p 8]

**FRENCH NUCLEAR FUEL**--Salem, Dec. 4--Quick follow-up action has been initiated by the authorities at the Nuclear Fuel Complex (NFC) in Hyderabad to get the French fuel and get it ready for the Tarapur plant. Dr. N. Kondal Rao, Chief Executive of the NFC, who was here in connection with a seminar on stainless steel told THE HINDU, "From our side, arrangements are being made to send empty cylinders to France to get the fuel." He said officers were already seized of the matter and engaged in identifying the agencies for transshipment and carrying out other supervisory work at the time of transfer from French containers to Indian cylinders. According to him, the cylinders will bring what is called enriched uranium hexafluoride, which will be converted into uranium dioxide powder, to be again converted into UO<sub>2</sub> pellets. Finally, the NFC will be sending to Bombay 'fuel bundles,' each weighing 140 kg. of uranium. Dr. Rao said approximately 20 tonnes of processed uranium in 'bundles' would be sent by the NFC. These will be further processed in Bombay. He said it would take at least 10 to 11 months from the time of receipt of the fuel from France for processing in Hyderabad. He expressed his satisfaction at the accord signed in New Delhi on November 26 between India and France. [Text] [Madras THE HINDU in English 5 Dec 82 p 1]

## ZIA SAYS FOREIGN POWERS EXERTING PRESSURE

Islamabad THE MUSLIM in English 6 Dec 82 pp 1, 8

[Text]

LAHORE, Dec. 5: President, Ziaul Haq, has said that the main thrust of the present regime was towards achieving an economic self-reliance in line with the Islamic principles, establishing an atmosphere of political stability and guarding the geographical and ideological frontiers of Pakistan.

He said this in a 22-page interview with the monthly 'Urdu Digest'.

Gen. Zia said Pakistan's friends, who were fully aware of the energy needs of this country, agreed that there was no alternative to nuclear energy to mend the situation. But, they were exerting pressure that this country should hand-over all its nuclear installations to international inspection.

President Zia said, Pakistan, was ready for international inspection of all its installations which would be constructed in future, to be covered by an agreement. But, it would never barter away its independence and self-respect to accept any unreasonable condition. Pakistan, he added, had already agreed to conditions which no other country had so far accepted.

The President said that Pakistan would be able to install a nuclear power project of 1,000 megawatts and was ready to acquire nuclear technology from any source which suited its requirements. Pakistan's nuclear programme, he said, would certainly not be curtailed if uranium was not available

from foreign sources. It had enough uranium deposits and talented scientists to exploit them, he added. The only thing which the country needed to achieve its objectives in the nuclear field were internal stability and a strong government.

Discussing the internal affairs of the country, the President said that general elections would be held at an appropriate time. There was no alternative to elections, he said. But, the delay had been necessitated because his government wanted that the atmosphere should be cleansed a bit more and the institutions on which the positive results of the elections depended, should start functioning on proper lines. The President said he was trying his best to install a representative government in accordance with Islamic principles by August next year.

The President said the constructive programme of his government had the support of political parties which believed in an Islamic political system and for whom the national solidarity was supreme. The government he said, was in constant touch with such parties, some of which were also very popular among the people.

President Zia said the prevalent conditions were not opportune for getting all the political parties together for a dialogue. However, he would take all the parties into confidence once he had formulated the framework for the future system of government. He said it was before time to disclose the features of this framework, but, he added, he would do so fairly soon. -APP

# PLANS FOR WORK ON CHASHMA PROJECT DISCUSSED

Islamabad THE MUSLIM in English 6 Dec 82 p 4

[Editorial: "Green Light to Chashma Project"]

[Text]

THE Pakistan Government has given the go-ahead for the construction of a 900 Megawatt Nuclear Power Project which is expected to be completed in 6 years. The announcement in this regard by the Chairman of the Pakistan Atomic Energy Commission, Mr. Munir Ahmed Khan will be welcomed by all those who have long-held convictions that our energy needs must be met by nuclear power. This project will be the second largest project in terms of capital invested after the Karachi Steel Mills. The government has already invited tenders for this purpose and if all goes well, the construction work on the Chashma Project will begin after one year. The PAEC Chairman further underlined in the course of his press talk that while Pakistan had its own enrichment processes as well as large resources of natural uranium, it would insist on additional enrichment facilities. The Chashma Project will also be covered by the stringent safeguards imposed by the International Atomic Energy Agency.

In these difficult economic times when most Third World countries are grinding under heavy oil import bills, nuclear power is a necessary and indispensable source to meet our national energy requirements. Already Pakistan whose oil import bill was only 60 million dollars in 1973 now has to dole out 1.5 billion dollars to meet the cost of imported oil. Rather regrettably most of the Western countries, particularly the United States which have well developed nuclear power plants as well as atomic weapons of mass destruction, have a rather myopic attitude on this issue. It was in the context of the unilateral Canadian cancellation of assistance to KANUPP that Mr. Munir Ahmed Khan candidly stated that Pakistan could not rely on "friends" because their policies were inconsistent as well as whimsical. It is no accident that the news of Pakistan floating international tenders for the Chashma Project was first broken by The New York Times a few days ago. In the past, the Western media has been launching a campaign of vilification against Pakistan's nuclear programme and accusing this country of covertly building an "Islamic Bomb".

Even in the briefing given by the Foreign Secretary on the eve of President Zia's visit to United States, it was officially stated that the nuclear programme is an area of differ-



ence in Pakistan-American relations. Given this context, the timing of the announcement of launching of the Chashma nuclear power project seems quite significant. Since the nuclear programme is bound to come for discussion in Washington the timing of the announcement re-affirms Pakistan's resolute commitment to continue with the nuclear programme, while resisting all pressures and arm-twisting from various quarters. The hands of the government are strengthened on this issue because it knows that a national consensus exists among all sections of the population. This national consensus calls for a "no compromise" posture and pursuance of a policy that best serves the interests of Pakistan. In fact, it would be a better and more positive way of mobilising public opinion, if the nuclear issue was debated openly in newspaper columns as is the case in neighbouring India. We have in our columns already taken the initiative by publishing a very well thought out piece on Pakistan's nuclear option written by an eminent diplomat with long experience in foreign affairs. It is our hope that such articles will provide an impetus to others to write so that an issue which is vital to the future of Pakistan is debated and discussed in an open and candid manner. The government has done well to maintain a stance of unwavering support to Pakistan's nuclear programme — a stance we hope will be further strengthened and reiterated during discussions by President Zia with American officials in Washington.

CSO: 5100/4315



# RIGHT TO EXERCIZE NUCLEAR CAPABILITY OPTION STRESSED

Islamabad THE MUSLIM in English 5 Dec 82 p 4

[Editorial: "Conference With a Difference"]

[Text]

THE three-day Conference on 'Strategy for peace and security in South Asia' which concluded in Islamabad on Tuesday provided the first occasion for scholars, researchers and diplomats from eleven countries to sit together and hold free and frank discussions on a subject of vital importance to the region. Its significance lay in the fact that it was held at a time when events in Afghanistan and Lebanon had considerably eroded faith in the security of countries in this part of the World. The many illuminating papers read and valuable ideas put forward to promote mutual cooperation and work together to resolve nagging issues and banish tensions should, if faithfully implemented, help to rectify the rather precarious situation prevailing today. The real politik and the concept of areas of influence, which had led to the bullying of the weak by the strong, were made to be seen as the root cause of insecurity and were, therefore, to be shunned. The experience gained at this conference, the credit for which goes to Pakistan's Institute of Strategic Studies and the Area Studies Centre of the Quaid-e-Azam University, should actuate a wider pool of talent to think over the issues involved and articulate their suggestions for the realisation of the ends visualised by participants in this singular get together.

From Pakistan's point of view, the Conference presented a welcome opportunity for a face-to-face discussion between the Indian representatives, led by their eminent strategist K. Subrahmanyam, and our own counterparts here. At a time when it was generally believed that the Indians, who had all along been prone to stick to their inflexible stance, a sense of balance and mutual understanding was induced by two senior former diplomats from Pakistan and India, Mr. Agha Shahi and Mr. I.K. Gujral. This had led Mr. Subrahmanyam to adopt an unusually mellow tone and proclaim that it was his first visit to Pakistan and that he was open to persuasion on any topic. Later, in the course of an exclusive interview with this paper he openly said that Pakistan had the right to develop nuclear capability if it so desired just as India had done. This has opened a new vista for greater understanding between the two countries on this matter of vital concern to us which appears to have irritated many, including the American Administration.

As an independent and sovereign state, Pakistan has no reason to be knuckled under by any outside power. Islamabad is fully alive to its needs and it is up to the government to adopt all measures necessary to meet these needs. We do not have to bow down to any pressure, no matter whence it comes. No free country lets itself be cowed down to pander to the whims and fancies of others. While our nuclear facilities are at present geared to the production of the much needed energy to strengthen the country's industrial base and improve the lot of our rural population, threats from outside, like the one from Israel for instance, may force us to move up to the nuclear option. It is good to see that on the nuclear issue, as on 99 per cent of global economic issues, the thinking of Pakistan and India has begun to converge. As neighbours, these two countries have to develop a common approach to matters of import, and that carries more weight than any extraneous factors.

CSO: 5100/4315

## NUCLEAR ENERGY ADVOCATED AS WAY TO SELF-SUFFICIENCY

Islamabad THE MUSLIM in English 4 Dec 82 p 3

[Article by Saeed Qureshi]

[Text]

ISLAMABAD, Dec. 3: In the backdrop of the fast depleting indigenous energy resources the "Scientists Club" in a meeting yesterday estimated that to attain self sufficiency in the energy sector by the year 2,000 Pakistan needs an investment of 30 to 43 billion dollars.

Dr. Arshad Mohammad Khan, an eminent scientist in the Pakistan Atomic Energy Centre, by leaning over figures and statistics slides, painted an extremely depressive picture of the energy situation in Pakistan warning that if remedy was not found all the foreign exchange earnings will be by the oil bill after five years.

The discussion of the Club brought into sharp focus many an important energy question. At one stage the protagonists of various energy resources appeared to be puzzled in fixing priority of a particular energy sector to be developed first. The principal speaker said that Pakistan was relatively unfortunate in the field of fossil fuels but it was also lagging behind in the development of renewable energy resources. The energy potential of Pakistan was to the tune of 7,000 million tons of oil, 5,000 tons gas in terms of coal and 1500 to 2000 million tons of coal.

For self-sufficiency oil in the coming decades Dr. Arshad calculated Pakistan needed 7.2 billion dollars of investment. Dilat-

lag upon the loss sustained by Pakistan Dr. Arshad postulated if there was shortage of one megawatt of electricity, the resultant loss in the industrial field was 800 million tons of fertilizer, 2,400 million tons of steel and 10,000 million tons of cement, putting the cumulative loss at four million dollar of the GDP. He said that with the depletion of the energy resources industrial activity will also be slowing down and a time would arrive when the situation would become unmanageable. He said on the other hand energy consumption was increasing, population growing and urbanisation taking place at a fast rate.

Throwing out options for Pakistan as a possible solution of the energy crisis the speaker suggested development of nuclear energy as the best and the most reliable choice. Together, he outlined a 20 years programme to make Pakistan self-sufficient in fossil energy sources by tapping the hidden reserves.

He also recommended harnessing what he called the soft energy sources like solar, wind and waves but indicated that at least fifty years would take before these sources could be commercially developed.

The session was chaired by R.U. Suleman, Chairman National Fertilizer Development Centre, and was addressed by Aneeq Mufti, Director Silicon Technology and Dr. Akhtar Ali of the Pakistan Oilfields. Dr. Rashid Khan of the Rawalpindi General Hospital acted as coordinator.

## BRIEFS

NUCLEAR SAFEGUARDS--Director general of the International Atomic Energy Agency [IAEA] Dr Hans Blix says the nuclear installation near Karachi in Pakistan does not have effective safeguards against diversion of nuclear fuel. Addressing a news conference in New Delhi today, he said the agency inspected the installation last year and suggested certain improvements. The Pakistan Government has agreed to take some measures but details have yet to be worked out on fixing emergency air lock to the reactor. Dr Blix is on a week-long visit to India at the invitation of the government to acquaint himself with the nuclear progress of the country. He will meet External Affairs Minister P. V. Narasimha Rao this evening before leaving for Vienna tomorrow. Answering a number of questions on the role of the agency in regard to safeguard at the Tarapur plant, Dr Blix said the IAEA would operate the same level of safeguards as before under the new arrangement between India, the United States and France. Dr Blix said he is deeply impressed by India's capability in various departments of the nuclear program and profuse research work being carried on at various levels. He said the nuclear programs for peaceful purposes are essential. Nuclear power will be much cheaper than the energy produced from coal or oil. About the withdrawal of the United States from the IAEA Dr Blix said a reappraisal on this question is going on in Washington and we hope that the United States will come back. [Text] [BK181408 Delhi General Overseas Service in English 1330 GMT 18 Dec 82]

CSO: 5100/4321

FRENCH GOVERNMENT DEBATES SALE OF REACTORS TO SOUTH AFRICA

Paris LE MONDE in French 9 Dec 82 p 8

[Article by Bruno Dethomas]

[Text] If it could be said that the possible sale of additional nuclear reactors to South Africa was "the straw which broke the camel's back," nothing could be less certain. The mere fact that the question could be raised is, however, enough to shock that ceaseless critic of the policy of apartheid, Mr Cot.

In fact, in the month of May, the South African Electricity Supply Commission (ESCOM) approached the FRAMATOME [Franco-American Atomic Construction Company] with a view to the future purchase of two new nuclear reactors. The French firm, which has already built two 900 MW reactors in Koeberg for Pretoria, the first of which is scheduled to be commissioned within a few weeks, then asked the government for guidelines.

The South Africans, after having expressed some concern when the socialists won power in French, were able very quickly to perceive the good will evidenced by Paris in nuclear matters. Deprived of enriched uranium by the Americans on the basis of the 1978 Nuclear Nonproliferation Act, as India had been, the South Africans then turned to the European market to obtain the enriched uranium needed for the manufacture of two cores and four recharges so that the Koeberg installation could be commissioned.

Via a complicated route, they obtained what they needed. Uranium enriched by the EURODIF [European Diffusion Agency], belonging, it appears, to the Franco-Belgian Tihange company (in which the EDF [French Electric Company] holds 50 percent of the shares) was sold to two American brokers, Eldow, in Washington, and Surico, in Maryland, before being returned, as planned, to the Franco-Belgian Fuel Manufacturers (FBFC) for finishing. Throughout all of this, the French government, at the very least, averted its eyes.

But what was done in that case with relative discretion, and might still be attributed to tradition, changed in nature when it came to supplying two reactors. Now no one has forgotten the keen protests of the socialist party, which on 3 June 1976, after the signing of the first contract, denounced "an agreement which ruins our credibility with the peoples of Africa and will

lead to a perilous increase in tensions in the southern part of the continent." And one cannot underestimate the consequences of such a contract on African politics.

In this regard, one must also weigh in the balance the thousands of jobs which would be created by the building of these reactors by France and the \$12-\$15 billion francs this order would represent--a godsend when one considers the state of our foreign trade and Pretoria's reputation as a payor.

The government was rather worried about having to take up this eternal debate between realism and principle. Particularly since Paris was not so certain of the real interest of the South Africans--they do not have such extensive electricity needs, and they are investing substantially in coal-burning power plants.

Now as it happened, the ESCOM request evaporated in the autumn. The Foreign Nuclear Policy Council therefore withdrew this matter from its agenda last 20 October. This body, over which the chief of state presides, and which defines the export policy for nuclear equipment, includes the prime minister and the ministers of defense, external relations, foreign trade, research, industry and energy, and the administrative delegate of the atomic energy commissariat, nonetheless made a survey of views. It is reported that Mr Chevenement vigorously pleaded the cause of such a sale, while Mr Cheysson opposed it with equal vigor.\* It is said that Mr Jobert was "not very clear," while the president of the republic said that he was "rather against it."

There can hardly be any doubt that Mr Cot was in a more awkward position than Mr Cheysson on this matter. But since the question will not come up again until the end of 1983, when it is thought the South Africans will issue an international invitation to bid, the minister delegate has no reason to plunge into this matter. Or are there perhaps reasons which cause him to fear that things are moving in the wrong direction?

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CSO: 5100/12

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\* In a letter dated 24 November and addressed to the president of the Anti-Apartheid Movement, which was published on Wednesday, 8 December, by LIBERATION, Mr Claude Cheysson wrote that the French government had not "at the present time planned to authorize the sale" of a new nuclear plant to South Africa, and that "if this question were to be raised," he would "personally be opposed."

## NUCLEAR-POWER FIRM PRESENTS PLAN FOR BURIAL OF WASTE IN ROCK

Helsinki UUSI SUOMI in Finnish 26 Nov 82 p 8

[Text] Highly radioactive nuclear waste can be safely deposited in Finland's bedrock in copper cylinders. This is what Teollisuuden Voima Oy (TVO) [Industrial Power Company] believes in its report on the definitive placement of nuclear power plant waste in two operations. TVO submitted its report on the matter to the Commerce and Industry Ministry yesterday. In TVO's opinion, the small amount of ground water in the solid and firm bedrock of Finland will guarantee the safety of the method.

According to TVO general manager Magnus von Bonsdorff, the fact that a technique has in principle already been developed whereby a definitive placement can be effected adds to the plausibility of the method.

"Since the time for a definitive placement will not come until after the year 2000, we can in the meantime follow developments and find economically more advantageous methods," general manager von Bonsdorff said.

While TVO feels that the definitive placement of nuclear waste in Finland is a very realistic alternative, it is still also investigating the possibilities of using foreign services.

Then, aside from a definitive placement, it may also be a matter of retreatment. This, however, presupposes a considerable reduction in the cost of retreatment as well as a sizable increase in the capacity of the retreatment plants.

#### Intermediate Storage in Water Basins

It is estimated that TVO's present power plants will use 1,200 tons of fuel during their operational lifetimes.

Radioactive waste is tightly bound inside the fuel rods. When the waste has cooled off inside the plant for about a year, it can be transferred to an intermediate storage facility.

According to TVO plans, waste will be kept in intermediate storage for 40 years. TVO plans to build an intermediate storage facility for the power plant area on the southwest side of its present number-one plant. This intermediate



storage facility would be built using a water-basin technique and TVO plans to submit its preliminary safety report for consideration regarding the granting of a construction permit by as early as the end of this year.

According to the plan, work would begin on the construction of the intermediate storage facility at the beginning of 1984 and the first phase would be completed by the end of 1987. According to TVO calculations, the technical operational life of the intermediate storage facility would be 60 years.

At the intermediate storage facility waste material cooled by sea water would be encapsulated in capsules of 500-fuel-rod bundles. In TVO's opinion, a copper capsule developed by the Swedes would also be suitable for Finnish conditions.

For the amount of waste produced by the Olkiluoto power plants, 850 capsules would be needed.

#### Placement Will Not Require Much Space

In accordance with present-day blasting techniques, the capsules could be deposited in tunnels located at a depth of about 500 meters.

An area 400 meters wide by 500 meters long inside the rock would be large enough for the amount of waste produced by Olkiluoto's number-one and two power plants. If the encapsulating plant is combined with the facility at the same surface site, definitive placement of the waste along with the different operational phases would not require much space.

As TVO sees it, copper capsules deposited in tunnels which would be sealed against the effects of ground water with bentonite and sand bentonite, which expand [to produce a watertight seal], will guarantee that the waste will to a large extent not dissolve for about a million years.

Thereafter, according to the most pessimistic calculation, TVO is of the opinion that the amount of radiation released into the environment would correspond to only a hundredth of the natural background radiation.

After the definitive placement area has been filled and sealed off, TVO estimates that the surface above the site can be safely used for any purpose whatsoever.

Definitive placement of waste in the way just proposed by TVO would cost 1.45 million marks at this year's cost levels.

The report TVO has just submitted to the Commerce and Industry Ministry is based on detailed studies of partial areas set aside for definitive placement of waste conducted between 1980 and 1982. In addition to Finnish research institutes, the matter has been studied in Sweden at the Stripa Rock Laboratory.

### Exact Schedule

TVO has drawn up a detailed and flexible schedule for the definitive placement of nuclear waste.

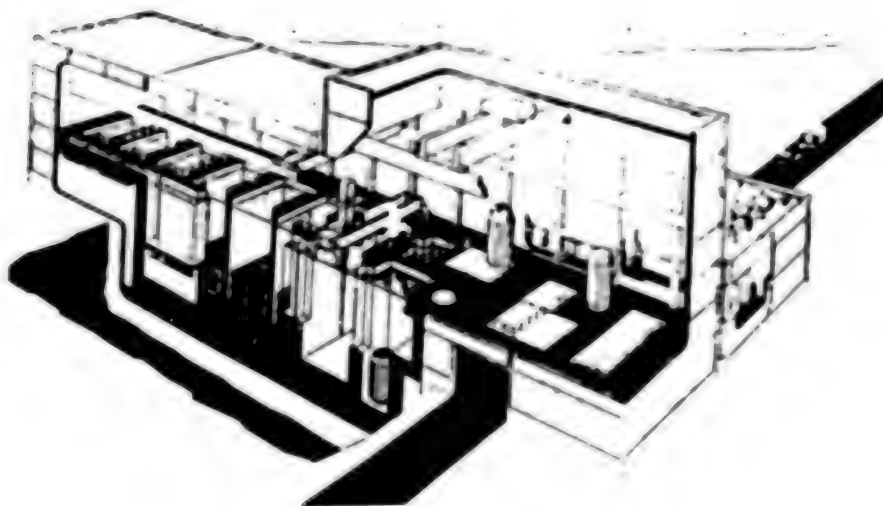
According to it, after the studies now being made are completed, preparations will be made to look for a preliminary placement site up until 1985.

After that phase, they would continue to study from five to ten preliminary placement site alternatives until the end of 1992.

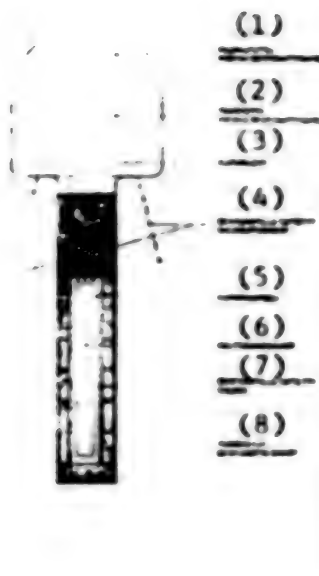
Placement site investigations would be completed by about the year 2000.

According to TVO, the final placement site will be decided on by 2010.

This schedule can be accelerated as may be necessary, but at the present time at least there is no need for communes to offer themselves as placement sites.



According to this sketch, TVO plans to locate its intermediate storage facility at the southwest side of Olkiluoto's number-one power plant. The total volume of the storage facility to be built in two stages would be 89,000 cubic meters.



**Key:**

1. Sand bentonite filling applied by spraying.
2. Compressed sand bentonite filling.
3. Copper plate.
4. Drainage holes filled with bentonite.
5. Copper capsule.
6. Fuel rods.
7. Seam filled with bentonite.
8. Compressed bentonite blocks.

When the copper capsules are placed in the holes drilled in the bottoms of the tunnels in the rock, the tunnels can be sealed and filled with bentonite.

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CSO: 5100/2531

# NEW FUEL TYPE TO BE PRODUCED AT PIERRELATTE

Paris NUCLELEC in French 14 Sep 82 pp 10,544, 10545

[Article: "Nuclear Fuels/France. Green Light for the 'Y' Plant"]

[Text] The OFFICIAL JOURNAL of 9 September published the text of the decree authorizing the COGEMA [General Atomic Materials Company] and FRAMATOME [Franco-American Atomic Cooperation] companies to create a nuclear fuel manufacturing plant at the Pierrelatte commune site.

The green light has thus been given to begin construction of this new French PWR [Pressurized Water Reactor] nuclear fuel manufacturing plant, which had been known as the "Y" plant at the planning stages.

In the reorganization that took place a year ago in the PWR fuel industry, FRAMATOME and the CEA [French Atomic Energy Commission] have pooled their abilities and capacities to create two subsidiaries in which they are equal partners.

The two companies thus created have received the names of FRAGEMA, whose vocation is the study, realization and marketing of fuel elements, and CFC (COGEMA FRAMATOME COMBUSTIBLE [fuel]) responsible for the construction and operation of the "Y" fuel manufacturing plant.

The OFFICIAL JOURNAL stipulates that the maximum fuel manufacturing capacity of the plant will correspond to the use of 1250 tons of uranium. This capacity can be reached by putting successive sections into service.

That is precisely what is going to happen since, at first, production capacity will be 500 tons. This production ought to be able to start in late '83 or, rather, early '84.

After that, capacity will be gradually increased depending on the needs of EDF [French Electricity Company] and foreign customers.

The AFA (advanced French assembly) fuel constitutes a new type of fuel element for reactors of the ordinary water pressurized type that EDF is building.

While the standard fuel elements in nuclear power plants use Inconel as the structural material, the AFA will use Zircaloy, a material that absorbs fewer neutrons and which contains less cobalt.

These characteristics should result in better efficiency in the use of uranium and a decrease of radioactivity in the primary circuit and, consequently, of the doses absorbed by personnel during maintenance operations.

The AFA has other advantages. Its weldings will be done by electron bombardment, which will result in less deformation of the welded surfaces and will make milling easier.

Because it can be disassembled at its top and bottom, it can be repaired during a programmed reactor shutdown. This disassembly capability could also facilitate reprocessing operation processes.

Among French manufacturers, the new plant will be juxtaposed with the FBFC (Franco-Belgium fuel manufacturing) at Romans, in the Drome, and Dessel, in Belgium, whose total capacity is 800 tons a year of uranium content.

It should be mentioned that COGEMA bought SICN (Industrial Nuclear Fuel Company) in 1980 which, in its two plants at Annecy and Veurey, manufactures the natural uranium fuels for the French gas-graphite type and the fuel structures for the Superphenix.

The Y plant will employ from 300 to 400 persons who will come, for the most part, from other COGEMA establishments.

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CSO: 5100/2523

# FIRST TRAINING COURSE FOR ACTING IN NUCLEAR ACCIDENT STARTS

Stockholm DAGENS NYHETER in Swedish 25 Nov 82 p 22

[Article by Anna-Lisa Backman]

[Text] Guys in gas masks on deserted rainy streets.

That was the scene in the middle of placid and idyllic Osthamar on Wednesday. Local firefighters, coast guardsmen, and police were undergoing a training course to prepare them for accidents at the Forsmark nuclear power plant.

The training course, which is both theoretical and practical, was the first in a series that will train a total of 1,200 people, primarily within a 30-mile radius of Forsmark.

Similar courses have started or will start in all counties where nuclear power plants are located, and in all, the 2-day course will eventually reach 4,650 people--ordinary firefighters, coast guardsmen, and police. The commanders have already taken the course. Local government employees, dairy personnel, bus drivers, and other local people will also be allowed to take part.

"Even in 'peacetime,' there are measurement stations in the field where radioactivity following a release of radiation will be measured directly by firefighters and coast guardsmen," said Hans Wiklund, training chief from the county government board in Uppsala.

He emphasized to DAGENS NYHETER's reporter: "I use military terms because I am an old military man. And we use the defense force's instruments and some know-how from the military preparedness plans against nuclear weapons."

Wiklund said: "The work will be directed from Osthamar. From here we will send out firefighters and coast guardsmen with measuring apparatus to ascertain where the 'plume' (the cloud and fallout) goes following a release of radiation. Their reports on the level of radioactivity will be collected at the fire station and conveyed to the county government board, which will use them as a basis for its decision to order an evacuation. The police will be in charge of the evacuation."

Following 1.5 days of theoretical study that included a lecture by a radiation protection expert from Forsmark, the men trotted off after a thin test plume in

central Osthhammar. Using intensimeters (measuring apparatus), dosimeters, gas masks, and radio, they reported on the emission from small radioactive poles that had been set out.

#### As Radioactive as a Watch

"They are radioactive all right, but no more so than a watch," said Wiklund.

Dosimeters are small pencil-like instruments that can tell how much radiation a person has been exposed to. Employees in nuclear power plants carry the same thing.

Fireman Stefan Lindgren of Osthhammar said: "If the dosimeter shows 3 roentgens when we are out looking for fallout, that is an occupational safety matter."

Fireman Yngve Karlsson of Graso said: "And if it goes up to 5 roentgens, we are called back in."

Wiklund said: "A person can never be ordered to do the job if the dosimeter shows 10 rads (another word for roentgens)."

He added: "The safest way is to wear a pressurized suit like those worn by firemen, but such suits weigh 17 kilograms, and they will not be used."

Yngve Karlsson of Graso--where the firefighting force consists of 13 men--had never worn a gas mask before.

But now the firemen will go to their fire stations and get an aluminum emergency kit containing, among other things, two gas masks (radiation surveyors work in pairs), rubber gloves, intensimeters, dosimeter chargers, and a flashlight. A total of eight such kits are in the area.

The kit does not contain an umbrella. In the booklet on radiation protection that is published by the National Institute of Radiation Protection and given to police officers, firefighters, and others taking the course, it says (on page 30) that umbrellas are a required piece of protective equipment:

"If it is raining when a cloud of radioactive matter passes over,... the simplest way to protect yourself and the measuring equipment is to use an ordinary umbrella."

In the danger zone surrounding Forsmark, there will be sirens that will sound if something happens, but they have not yet been installed.

Wiklund said: "If something happens now, we call up on the telephone, and the police go around with loudspeakers."

What will happen to nature if there is fallout?

Wiklund says: "Whether things will wither and so on is something we know very little about. But it may take years before the ground becomes usable. Studies



are underway in that connection to determine whether the earth should be removed with excavators and so on."

It was learned from a nuclear accident in Windscale, England in 1957 that milk must be discarded if the cows eat polluted feed.

Wiklund compares radioactivity to dirt. Just as an automobile tire gets dirty on a slushy day in Osthrammar, it can also get "dirty" due to fallout from a nuclear accident.

The National Fire Service Board has made plans for training courses in the counties with nuclear power plants. They will be held in March 1984.

They are being held in accordance with the Nuclear Protection Law that took effect in 1960 following the Windscale accident and the Nuclear Protection Ordinance that was issued in 1981 after the Harrisburg accident.

"Last fall, special brochures outlining the steps to be taken with animals in the event of a nuclear accident were sent to farmers in Forsmark's vicinity. We made a little test by going around and talking to three farmers. There was one place where someone remembered the brochure. But even there, they had paid no attention to what it said because they had gone to Forsmark for information the previous spring and learned that it is sufficient to leave the cows alone in the barn for 3 weeks after an accident and to leave home themselves."

It can be done because there is automatic watering in the barns nowadays.

"But what if a fuse blows?" asked the farmer who had received the information, and he was skeptical.

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BRIEFS

PANEL ON NUCLEAR-ACCIDENT PLANS--Varberg (TT)--The local safety committees for the country's four municipalities where nuclear power plants are located will meet in Varberg at the start of 1983 to discuss, among other things, preparedness plans for coping with possible accidents at those power plants. It is primarily the safety committee in Varberg, where the Ringhals nuclear power plant is located, that has been campaigning for better preparedness plans. Allan Hyden, chairman of the local safety committee in Varberg, says: "The preparedness plan that exists today is not a good one. Information to the public is faulty, and the warning system that exists is deplorable. The false alarms have come so thick and fast that people no longer pay any attention to them. So we want a new warning system. At the meeting, we also want to work on producing a well thought-out preparedness plan that will apply to all municipalities with nuclear power plants inside their borders." Hyden would like to see government representatives and representatives of the county government boards concerned attend the safety meeting. The county government boards are responsible for the preparedness plans. [Text] [Stockholm DAGENS NYHETER in Swedish 29 Nov 82 p 45] 11798

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